Work Order ID 68331

Tuesday, April 12, 2011 7:24:31 AM

Item ID: D2423 **Accept** **Setup Start**

Revision ID:

Item Name: Lug Extrusion 376 ft **Stop**

Start Date: 4/12/2011 **Start Qty:** 288.00 **Cust Item ID:**

Required Date: 5/6/2011 **Req'd Qty:** 288.00 **Customer:**

Reference:

Approvals: **Process Plan:** CL **Date:** 11/04/12 **Tooling:** _____ **Date:** _____ **Run Start**

QC: _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____ **Stop**

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	**Revision Nbr**								
D2423	Rev B1								
100	PURCHASING	0.00							
Purchasing									
Purchasing	**Memo**	0.00				CL	11/04/12	288	
	Issue P/O: 13848 Manufacture as per Dwg Possible Supplier: SIGNATURE ALUMINUM Material release note is required								
110	Receive & Inspect for Damage & Mat'l Certs	0.00				A.E	11-05-13		
Packaging									
Packaging	**Memo**	0.00				11/5/13		376 ft	
120	QC6- Inspect dimensions to drawing	0.00							
QC									
Quality Control	**Memo**	0.00				11/6/13			

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Work Order ID 68331

Tuesday, April 12, 2011 7:24:31 AM

Item ID: D2423 **Accept** **Setup Start**

Revision ID: **Stop**

Item Name: Lug Extrusion

Start Date: 4/12/2011 **Start Qty:** 288.00 **Cust Item ID:**

Required Date: 5/6/2011 **Req'd Qty:** 288.00 **Customer:**

Reference:

Run Start

Stop

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____

QC: _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130	Identify as per dwg & Stock Location: MAT 6	0.00							
Packaging	**Memo**	0.00				B11-5-31		3768	
Packaging									
140	QC21- Final Inspection - Work Order Release	0.00					4/6/2011		
QC	**Memo**	0.00							
Quality Control									

MF
11-05-13

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Picklist Print

Tuesday, April 12, 2011 7:24:28 AM

Work Order ID: 68331

Parent Item: D2423

Parent Item Name: Lug Extrusion

Start Date: 4/12/2011 **Required Date:** 5/6/2011

Start Qty: 288.00 **Required Qty:** 288.00

Comments: IPP □G□04.09.02□Part Number D2423-108 changed to D2423□KJ/JLM□

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D2423P Lug Extrusion		Purchased	No			100	f	0.0000	1	288			

4/6/5 (97)

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

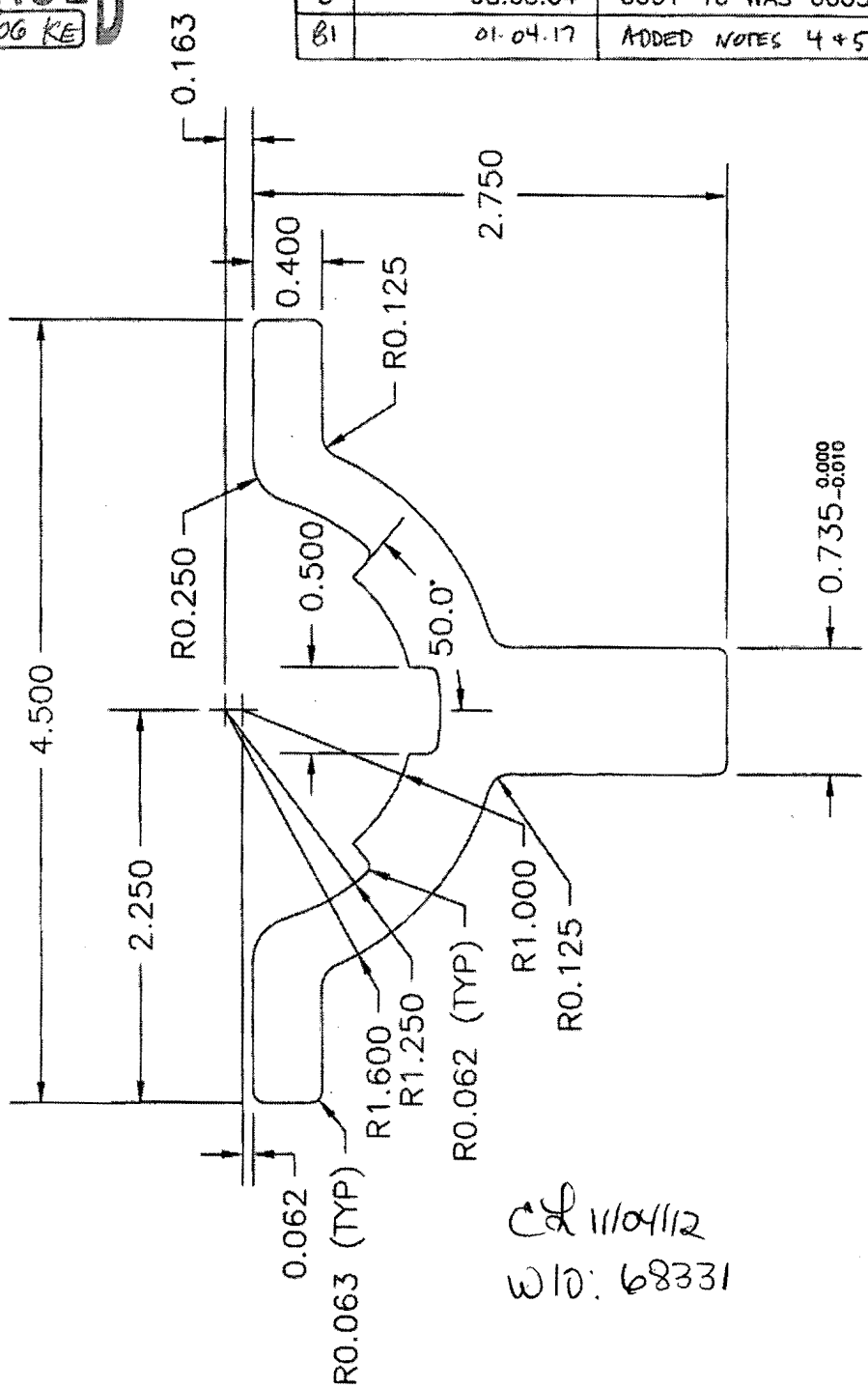
NOTE: Date & initial all entries

DESIGN	DRAWN BY	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
KE	KE		
CHECKED	APPROVED	DRAWING NO.	REV. B
		D2423	SHEET 1 OF 1
DATE		TITLE	SCALE
98.08.04		LUG EXTRUSION	1:1

A	95.05.09	NEW ISSUE
B	98.08.04	6061-T6 WAS 6005A.T5
B1	01.04.17	ADDED NOTES 4 + 5

DA COPY ISSUED

RELEASED
98/08/06 KE



1. MATERIAL: 6061-T6 ALUMINUM (QQ-A-200/8)
2. NOTE: ALL DIMENSIONS ARE IN INCHES
3. TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
4. MANUFACTURED USING CAMARON INDALEX DIE # MS-10866
5. PART NUMBER IS D2423-XXX WHERE XXX IS CUT LENGTH IN INCHES (EG. D2423-108 IS 108" LONG)

CL 11/04/12
W10: 68331

Dart Aerospace Ltd

W/O:	WORK ORDER CHANGES						
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:	WORK ORDER NON-CONFORMANCE (NCR)							
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID PO13848

Purchase Order Date 4/12/2011
PO Print Date 4/12/2011

Order From : VC-BON001

SIGNATURE ALUMINUM
1850 CLEMENTS ROAD
PICKERING, ON L1W 3R8
CA

Contact Name		**Buyer**	Chantal Lavoie
Vendor Phone	800 563 1079	**Requisition Nbr**	
Vendor Fax	800 565 8339	**Tax Resale Nbr**	10127-2607
Vendor Account Nbr		**Terms**	Net 30
		Currency	CAD
		FOB	Destination-Collect

Ship To : DART AEROSPACE LTD 1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

FAXED 4/12/11

Line Nbr	Reference / Revision ID / Vendor Part Number	Description / Mfg ID	Req Date / Taxable	Req Qty / Unit of Measure	Ship Method	Unit Price	Extended Price
1	D2423P	Lug Extrusion	5/13/2011 Yes	288.00 f	Yours ppd	$10.9850	$3,163.68
		Special Inst:	EXTRUDE AS PER DWG D2423 REV.B1 B68331 MATERIAL: 6061-T6 AS PER QQ-A-200/8 ALL DIMENSION ARE IN INCHES SIGNATURE ALUMINUM TOOL # DIE DAA-5				
2	D2600-1-160P	Extrusion Round 3" 206	5/13/2011 Yes	83.00 Each	Yours ppd	$39.4030	$3,270.45
		Special Inst:	EXTRUDE AS PER DWG D2600 REV. D1 B68284 MATERIAL: 6061-T6 AS PER QQ-A-200/8 MINIMUM YIELD STRENGTH = 35 KSI MINIMUM ULTIMATE TENSILE STRENGTH = 40 KSI MINIMUM ELONGATION = 8 % 160" LONG SIGNATURE ALUMINUM TOOL # 897121				

No substitution or deviation without consent.
Certificate of Conformity or Material Certification required when applicable

Change Nbr: 1 **Change Date:** 4/12/2011

signature aluminum CANADA INC

ACCT# 46024

INVOICING AND COMPANY LOCATION

SIGNATURE ALUMINUM CANADA
1850 CLEMENTS ROAD
PICKERING ON L1W 3R8

SHIPPING MANIFEST

MANIFEST DATE / DATE DU BODEREAU: 05-06-11

MANIFEST NUMBER / N° DE BODEREAU: 000961

SALES ORDER NUMBER / N° DE COM: 100762

REFER TO THESE NUMBERS ON ALL CORRESPONDANCE

REFEREZ-VOUS A CES NUMEROUS POUR TOUTE CORRESPONDANCE

SHIP TO / EXPÉDIÉ À	SOLD TO / VENDUE À
DART AEROSPACE LTD. 1270 ABERDEEN ST. HAWKESBURY, ON K6A 1K7 CANADA PHONE: 613-632-5200	DART AEROSPACE LTD. 1270 ABERDEEN ST. HAWKESBURY, ON K6A 1K7 CANADA PHONE: 613-632-5200

TERMS / FREIGHT	LOCATION	TRAILER NUMBER / REMORQUE Nombre	SALESMAN / VENDEUR	CREDIT REP / REP DU CRÉDIT	SALES REP / REP. DES VENTES
PP	PIC	1	138		H. CAMERON

CUSTOMER ID / ID DU CLIENT	ORDER DATE / DE LA COM	CUSTOMER PO NUMBER / CLIENT PO Nombre	JOB / FICHIER	FIELD SALES REP / REP REGIONAL DES VENTES	CUST SERVICE REP / REP. SERVICE CLIENTELE
46024	04/12/11	13848		M. BATES	cgerard
		BILL OF LADING NUMBER / NO. DE CONNAISSEMENT: 000961	CARRIER / TRANSPORTEUR: GOLDEN		

ITEM NO. / NUMÉRO	ORIGINAL ORDER QUANTITY / Quantité d'ordre ORIGINAL	UNIT / UNITÉ	PREVIOUS SHIPPED QUANTITY / PRÉCÉDENT Quantité livrée	MFG. PART NUMBER / MFG. PARTIE NUMÉRO CUSTOMER PART NUMBER / NUMÉRO DE RÉFÉRENCE DU CLIENT	ALLOY & TEMPER / ALLIAGE & TEMPER LENGTH / LONGUEUR CUTTING TOLERANCE / Tolérance de coupe	FINISH DESCRIPTION / DESCRIPTION DE FINITION FABRICATION DESCRIPTION /DESCRIPTION DE FABRICATION SHIPPING TOLERANCE / EXPÉDITION TOLERANCE	NBR OF PKGS / NBR DE PKGS	GROSS LBS / LIVRES BRUT	NET QUANTITY / QUANTITÉ NETTE	UNIT / UNITÉ	QUANTITY DUE / Quantité en raison
001	1,109	LB		DAA-5-2	6061		2	1,422	1,400	LB	
	503	KG		D2423P	96.0000 IN			645	635	KG	
	36	PC			Cut(+): 0.0000 Cut(-): 0.0000	Min: 0 % Max: 0 %			47	PC	
						802082 / 106185	1	847	836		28 PC
						802082 / 106187	1	575	564		19 PC

2	1,422	1,400	LB
	645	635	KG
		47	PC
TOTALS			

Transportation/Traffic damages and/or shortage claims are to be noted on the delivery copy of sellers shipping manifests and signed and dated below by customers authorized representatives.
No return materials will be accepted for credit without permission. The articles and/or services covered by this shipping manifest were produced in accordance with the fair labor standards act of 1938 as amended. Order accepted subject to the terms and conditions stated on the reverse side.

CUSTOMER ACKNOWLEDGEMENT OF GOODS DELIVERED AND CONDITION

DATE OF DELIVERY

DRIVER

CERTIFICATE OF COMPLIANCE

SIGNATURE ALUMINUM CANADA
1850 CLEMENTS RD
PICKERING, ON L1W 3R8

Cert Date	Cert No	Sales Order	Page
05/05/2011	5260520	100762	1
Cust PO	**B/L No**	**Lot**	**Date**
13848	000961	802082	05/06/11

Sold To	Ship To
46024 DART AEROSPACE LTD. 1270 ABERDEEN ST. HAWKESBURY, ON K6A 1K7 CANADA	46024 DART AEROSPACE LTD. 1270 ABERDEEN ST. HAWKESBURY, ON K6A 1K7 CANADA

Item No	Part No	Item Description	Cust Part
001	DAA-5-2	8 MILL 6061 T6	D2423P

Gross Weight	1,422 LBS		
Net Qty	1,400 LBS	47 PCS	2 PKGS

Specification	Dist Desc
AMS QQA 200/9 + ASTM B221-08	

Mechanical Tests:

Tensile MPA / KSI	Yield MPA / KSI	% Elongation	Conductivity	HREW
343.5 / 49.8	317.3 / 46.0	16.7	0.0	95

Chemical Analysis:

SI	FE	CU	MN	MG	CR	ZN	TI
0.67	0.27	0.29	0.05	0.90	0.06	0.08	0.02

This will certify that the material described herein has been inspected and tested in accordance with Signature Aluminum Canada's standard sampling and testing procedures or in accordance with the requirements of any specification forming a part of the material description to the extent indicated herein. Data of chemical compositionfor the material and test results from samples representative of the material are set forth above hereof or in any attachments hereto. This information shows that the material meets the applicable requirements. Inspection and test records are maintained on file. This certificate shall be deemed apart of and subject to the terms and conditions of warranty set forth on the reverse side of our order acknowledgement form. No other warranties are applicable.

R. Petersen, QA Manager Signature Aluminum Canada Inc

Chantal Lavoie

From: Sato, Helder <helder.sato@signaturealuminumcanada.com>
Sent: May 11, 2011 3:54 PM
To: Burton, Doris; Petersen, Ryan
Cc: Chantal Lavoie
Subject: RE: material certification

Hi Doris,

Sorry for the late reply. It is 6061 T6. There was an issue during the system change. Paul, Ryan and I have just fixed it in VIS.

Regards,

Helder Sato

Quality Engineer
Signature Aluminum Canada Inc.
Phone: +1 (905) 427-2213 / Fax: +1 (905) 427-2239
helder.sato@signaturealuminumcanada.com

-----Original Message-----
From: Burton, Doris
Sent: Wednesday, May 11, 2011 3:39 PM
To: Petersen, Ryan; Sato, Helder
Cc: Chantal Lavoie
Subject: FW: material certification

Guys, can you certify, by the Test Cert., that this metal is really 6061 T6?

-----Original Message-----
From: Chantal Lavoie [mailto:clavoie@dartaero.com]
Sent: Wednesday, May 11, 2011 3:19 PM
To: Burton, Doris
Subject: RE: material certification

Hi Doris,
Please reply we just want to make sure that material is really 6061-t6 .
Thanks
Chantal

From: Chantal Lavoie [mailto:clavoie@dartaero.com]
Sent: May 11, 2011 7:08 AM
To: 'Burton, Doris'
Subject: RE: material certification

Hi Doris,
Thank you, but can you assure us that the material used to manufacture the lugs extrusion is really 6061-T6.

Thanks
Chantal

From: Burton, Doris [mailto:Doris.Burton@signaturealuminumcanada.com]
Sent: May 10, 2011 3:33 PM
To: Chantal Lavoie
Subject: FW: material certification

Here it is.
Regards,

Helder Sato

Quality Engineer
Signature Aluminum Canada Inc.
Phone: +1 (905) 427-2213 / Fax: +1 (905) 427-2239
helder.sato@signaturealuminumcanada.com

-----Original Message-----
From: Burton, Doris
Sent: Tuesday, May 10, 2011 2:49 PM
To: Sato, Helder
Subject: FW: material certification

Helder – this is WO # 802082 (die DAA-5) – can we re-certify under a different specs?

-----Original Message-----
From: Chantal Lavoie [mailto:clavoie@dartaero.com]
Sent: Tuesday, May 10, 2011 2:36 PM
To: Burton, Doris
Subject: material certification

Hi Doris,
We have rec'd p/o:13848 for D2423P on certificate of compliance there is a mistake. The material for lugs is 6061-T6 as per QQ-A-200/8 but if you look at what was sent it is under AMS QQ-A-200/9.
Thanks
Chantal

CERTIFICATE OF COMPLIANCE

SIGNATURE ALUMINUM CANADA
1850 CLEMENTS RD
PICKERING, ON L1W 3R8

Cert Date	Cert No	Sales Order	Page
05/05/2011	5260520	100762	1
Cust PO	**B/L No**	**Lot**	**Date**
13848	000961	802082	05/10/11

Sold To	Ship To
46024 DART AEROSPACE LTD. 1270 ABERDEEN ST. HAWKESBURY, ON K6A 1K7 CANADA	46024 DART AEROSPACE LTD. 1270 ABERDEEN ST. HAWKESBURY, ON K6A 1K7 CANADA

Item No	Part No	Item Description	Cust Part
001	DAA-5-2	8 MILL 6061 T6	D2423P
Gross Weight	1,422 LBS		
Net Qty	1,400 LBS	47 PCS	2 PKGS
Specification			Die Desc
AMS QQA 200/8 + ASTM B221-08			

Mechanical Tests:

Tensile MPA / KSI	Yield MPA / KSI	% Elongation	Conductivity	HREW
343.5 / 49.8	317.3 / 46.0	16.7	0.0	95

VALUES WELL ABOVE MIL HANDBOOK (ATTACHED)

5/11/05-13

05.13 QS1042.

Chemical Analysis:

SI	FE	CU	MN	MG	CR	ZN	TI
0.67	0.27	0.29	0.05	0.90	0.06	0.08	0.02

This will certify that the material described herein has been inspected and tested in accordance with Signature Aluminum Canada's standard sampling and testing procedures or in accordance with the requirements of any specification forming a part of the material description to the extent indicated herein. Data of chemical compositionfor the material and test results from samples representative of the material are set forth above hereof or in any attachments hereto. This information shows that the material meets the applicable requirements. Inspection and test records are maintained on file. This certificate shall be deemed apart of and subject to the terms and conditions of warranty set forth on the reverse side of our order acknowledgement form. No other warranties are applicable.

R. Petersen, QA Manager Signature Aluminum Canada Inc

Table 3.6.2.0(g). Design Mechanical and Physical Properties of 6061 Aluminum Alloy Extruded Rod, Bar, and Shapes

Specification	AMS 4161, AMS 4172, & AMS-QQ-A-200/8	AMS-QQ-A-200/8	AMS 4160 & AMS-QQ-A-200/8	AMS-QQ-A-200/8			
Form	Extruded rod, bar, and shapes						
Temper	T4, T4510, and T4511	T42[a]	T62[a]	T6, T6510, and T6511			
Cross-sectional area, in.^{2}	...	...	...	≤32			
Thickness,[d] in.	≤3.000	All	All	≤1.000		1.001-6.500	
Basis	S	S	S	A	B	A	B
Mechanical Properties:							
F_{tu}, ksi:							
L	26	26	38	38	41	38	41
LT	...	...	...	37	40	33	35
F_{ty}, ksi:							
L	16	12	35	35	38	35	38
LT	...	...	...	33	36	28	31
F_{cy}, ksi:							
L	14	...	...	34	37	34	37
LT	...	...	...	35	38	30	33
F_{su}, ksi	16	...	...	26	28	19	21
F_{bru}[b], ksi:							
(e/D = 1.5)	42	...	...	64	69	52	57
(e/D = 2.0)	55	...	...	82	88	69	74
F_{bry}[b], ksi:							
(e/D = 1.5)	22	...	...	54	58	42	46
(e/D = 2.0)	26	...	...	60	65	50	55
e, percent (S-basis):							
L	16	16	10[c]	10[c]	...	10	...
E, 10^3 ksi	9.9						
E_c, 10^3 ksi	10.1						
G, 10^3 ksi	3.8						
μ	0.33						
Physical Properties:							
ω, lb/in.^{3}	0.098						
C, K, and α	See Figure 3.6.2.0						

a Design allowables were based upon data obtained from testing samples of material, supplied in the O to F temper which were heat treated to demonstrate response to heat treatment by suppliers. Properties obtained by the user, however, may be lower than those listed if the material has been formed or otherwise cold or hot worked, particularly in the annealed temper, prior to solution heat treatment.

b Bearing values are "dry pin" values per Section 1.4.7.1.

c For thicknesses ≤0.249 inch, e = 8%.

d The mechanical properties are to be based upon the thickness at the time of quench.